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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/766,003	01/29/2004	Andrew J. Moss	118414	2014

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EXAMINER	
NORTON, JENNIFER L	
ART UNIT	**PAPER NUMBER**
2121	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/02/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/766,003	MOSS, ANDREW J.	
	Examiner	Art Unit	
	Jennifer L. Norton	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4,6-10 and 12-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6-10 and 12-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 January 2004 and 09 January 2007* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The following is a **Non-Final Office Action** in response to the Request for Continued Examination filed on 09 January 2007. Claim 1-4, 6-10, 12, 14 and 16 has been amended. Claims 17 and 18 are newly added. Claims 5 and 11 have been cancelled. Claims 1-4, 6-10 and 12-18 are pending in this application.

Drawings

2. The amendment to the Drawings was received on 09 January 2007. The correction is acceptable.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1, 3, 7, 9 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over UK Patent Application Publication No. 2,229,556 (hereinafter Carpenter) in view of U.S. Patent 4,243,922 (hereinafter Sobotta).

5. As per claim 1, Carpenter teaches a control system for supplying a control signal to a controlled apparatus, the system comprising:

an error generator (Fig. 3, element 322) that produces an error signal from a feedback value relating to a measured first operating parameter (Fig. 3, element 324) of a controlled apparatus (abstract, lines 1-5, pg. 7, lines 16-18, pg. 10, lines 20-28 and Fig. 3, element 346); and a required value (Fig. 3, element 320) relating to a desired first operating parameter value of the controlled apparatus (pg. 7, lines 18-23);

a controller (abstract, lines 1-5, pg. 3, lines 12-16, pg. 7, lines 31-34, pg. 8, lines 1-6, pg. 17, lines 20-26 and Fig. 3, element 344) that receives the error signal and a gain signal and generates a control signal based on the values thereof (col. 15, lines 1-15);

a gain selector (pg. 7, lines 7-10 and 23-26, pg. 9, lines 20-24 and Fig. 3, element 330); and

a disturbance compensator (Fig. 3, element 336) that receives an input value relating to a measured second operating parameter of the controlled apparatus (pg. 8, lines 20-23 and pg. 10, lines 9-16), receives the error signal, produces a compensated error signal based on the input value and the error signal (pg. 10, lines 16-20).

Carpenter does not expressly teach providing the compensated error signal to the gain selector, wherein the gain selector receives the compensated error signal and

provides the gain signal to the controller based on the value of the compensated error signal.

Sobotta teaches to providing a compensated error signal to a gain selector (col. 3, lines 8-13) and provides the gain signal to the controller based on the value of the compensated error signal (col. 3, lines 4-7 and Fig. 1).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter to include providing a compensated error signal to a gain selector and provides the gain signal to the controller based on the value of the compensated error signal to provide the advantage of optimizing the response and the period of time needed to reduce the error signal which depend on the rate of change of measured and/or command input values (col. 2, lines 14-21).

6. As per claim 3, Carpenter as set forth above teaches the error signal (Fig. 3, element 322) equals the difference between the required value (Fig. 3, element 320) and the feedback value (pg. 7, lines 18-23 and Fig. 3, element 324).

7. As per claim 7, Carpenter teaches a method for controlling a controlled apparatus having a measured first operating parameter, the method comprising:

generating an error signal (Fig. 3, element 322) from a feedback value relating to a measured first operating parameter (Fig. 3, element 324) of a controlled apparatus (abstract, lines 1-5, pg. 7, lines 16-18, pg. 10, lines 20-28 and Fig. 3, element 346) and a required value (Fig. 3, element 320) relating to a desired value of the first operating parameter of the controlled apparatus (pg. 7, lines 18-23);

generating a compensated error signal based on an input value relating to a measured second operating parameter of the controlled apparatus (pg. 8, lines 20-23 and pg. 10, lines 9-16) and the error signal (col. 10, lines 16-20).

Carpenter does not expressly teach selecting a gain signal based on the compensated error signal; and generating a control signal based on the error signal and the gain signal.

Sobotta teaches to selecting a gain signal based on a compensated signal (col. 3, lines 8-13); and generating a control signal based on the error signal and the gain signal (col. 3, lines 3, lines 4-7 and Fig. 1).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter to include selecting a gain signal based on a compensated signal; and generating a control signal based on the error signal and the gain signal to provide the advantage of optimizing the

response and the period of time needed to reduce the error signal which depend on the rate of change of measured and/or command input values (col. 2, lines 14-21).

8. As per claim 9, Carpenter as set forth above teaches the error signal (Fig. 3, element 322) equals the difference between the required value (Fig. 3, element 320) and the feedback value (pg. 7, lines 18-23 and Fig. 3, element 324).

9. As per claim 13, Carpenter as set forth above teaches a gas turbine engine controller (abstract, lines 1-5, pg. 3, lines 12-16, pg. 7, lines 31-34, pg. 8, lines 1-6, pg. 17, lines 20-26 and Fig. 3, element 344).

10. As per claim 14, Carpenter as set forth above teaches the measured first operating parameter is temperature (pg. 7, lines 18-23 and pg. 17, lines 27-29).

11. As per claim 15, Carpenter as set forth above teaches a method of controlling a gas turbine engine (abstract, lines 1-5, pg. 3, lines 12-16 and Fig. 3, element 346).

12. As per claim 16, Carpenter as set forth above teaches the measured first operating parameter is temperature (pg. 7, lines 18-23 and pg. 17, lines 27-29).

13. Claims 2, 6, 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carpenter in view of Sobotta in further view of U.S. Patent No. 6,389,816 (hereinafter McCarty).

14. As per claim 2, Carpenter in view of Sobotta does not expressly teach the control signal generated by the controller is equivalent to the error signal multiplied by the gain signal.

McCarty teaches a gain (Fig. 3, element 124) multiplies the error signal by the value of 1/K where K is initially set at a predetermined value (col. 3, lines 55-58).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a gain multiplies the error signal by the value of 1/K where K is initially set at a predetermined value for the purpose of adjusting the gain of the error signal to be equal to the desired change in the controlled engine parameter (Carpenter: col. 1-2, lines 66-68 and 1-3).

15. As per claim 6, Carpenter teaches a lookup table for receiving the input value (pg. 9, lines 20-24).

Carpenter in view of Sobotta does not expressly teach a multiplier for receiving a compensation value from the lookup table, and for multiplying the error signal by the compensation value to produce the compensated error signal.

McCarty teaches a gain (Fig. 3, element 124) multiplies the error signal by the value of 1/K where K is initially set at a predetermined value (col. 3, lines 55-58).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a gain multiplies the error signal by the value of 1/K where K is initially set at a predetermined value for the purpose of adjusting the gain of the error signal to be equal to the desired change in the controlled engine parameter (Carpenter: col. 1-2, lines 66-68 and 1-3).

16. As per claim 8, Carpenter in view of Sobotta does not expressly teach the control signal is equivalent to the error signal multiplied by the gain signal.

McCarty teaches a gain (Fig. 3, element 124) multiplies the error signal by the value of 1/K where K is initially set at a predetermined value (col. 3, lines 55-58).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a gain multiplies the error signal by the value of 1/K where K is initially set at a predetermined value for the purpose of adjusting the gain of the error signal to be equal to the desired change in the controlled engine parameter (Carpenter: col. 1-2, lines 66-68 and 1-3).

17. As per claim 12, Carpenter does not expressly teach generating the compensated error signal further comprises:

receiving the input value (pg. 10, lines 1-5); and retrieving a compensation value from a lookup table based on the received input value (pg. 9, lines 20-24).

Carpenter in view of Sobotta does not expressly teach multiplying the error signal by the compensation value to produce the compensated error signal.

McCarty teaches a gain (Fig. 3, element 124) multiplies the error signal by the value of 1/K where K is initially set at a predetermined value (col. 3, lines 55-58).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a gain multiplies the error signal by the value of 1/K where K is initially set at

a predetermined value for the purpose of adjusting the gain of the error signal to be equal to the desired change in the controlled engine parameter (Carpenter: col. 1-2, lines 66-68 and 1-3).

18. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carpenter in view of Sobotta in further view of U.K. Patent No.: 1,135,508 (referred to as hereinafter IBM (International Business Machines))

19. As per claim 4, Carpenter in view of Sobotta does not expressly teach a filter means that filters the error signal and supplies a filtered error signal to the disturbance compensator gain in place of the error signal.

IBM teaches to a connection between a high pass filter (Fig. 1, element 23) and the output of the summing device (Fig. 1, element 9), and the high pass filter output to the amplifier to produce a gain (pg. 4, lines 9-12).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a filter means that is operable to filter the error signal and to supply a filtered error signal to the gain selection means in place of the error signal for the purpose of

modifying the abrupt nature of change in the position of a set point to allow the system to respond to the set point change more gradually (pg. 2, lines 12-20).

20. As per claim 10, Carpenter in view of Sobotta does not expressly teach the error signal is filtered and a filtered error signal is used in place of the error signal to generate the compensated error signal.

IBM teaches to a connection between a high pass filter (Fig. 1, element 23) and the output of the summing device (Fig. 1, element 9), and the high pass filter output to the amplifier to produce a gain (pg. 4, lines 9-12).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include a filter means that is operable to filter the error signal and to supply a filtered error signal to the gain selection means in place of the error signal for the purpose of modifying the abrupt nature of change in the position of a set point to allow the system to respond to the set point change more gradually (pg. 2, lines 12-20).

21. Claims 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carpenter in view of Sobotta in further view of U.S. Patent No. 6,955,039 (hereinafter Nomura).

22. As per claim 17, Carpenter in view of Sobotta does not expressly teach the measured second operating parameter is acceleration.

Nomura teaches to an acceleration measuring section (Fig. 1, element 10) of a gas turbine (Fig. 1, element 2) to measure acceleration of the combustors of the gas turbine (col. 9, lines 15-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include an acceleration measuring section of a gas turbine to measure acceleration of the combustors of the gas turbine to stop combustion oscillations (col. 9, lines 22-25) to improve reliability of the gas turbine and prolong service life, thus reduced maintenance cost (col. 2, lines 16-20), as well as improve operation control efficiency (col. 2, lines 26-29).

23. As per claim 18, Carpenter in view of Sobotta does not expressly teach the measured second operating parameter is acceleration.

Nomura teaches to an acceleration measuring section (Fig. 1, element 10) of a gas turbine (Fig. 1, element 2) to measure acceleration of the combustors of the gas turbine (col. 9, lines 15-21).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of applicant's invention to modify the teaching of Carpenter in view of Sobotta to include an acceleration measuring section of a gas turbine to measure acceleration of the combustors of the gas turbine to stop combustion oscillations (col. 9, lines 22-25) to improve reliability of the gas turbine and prolong service life, thus reduced maintenance cost (col. 2, lines 16-20), as well as improve operation control efficiency (col. 2, lines 26-29).

Response to Arguments

24. Applicant's arguments see Remarks pgs. 8-11, filed 9 January 2007 with respect to claims 1-3, 5, 7-9, 11 and 13-16 under U.S.C. 102(b) have been considered but are moot in view of the new ground(s) of rejection.

25. Applicant's arguments see Remarks pgs. 11-12, filed 9 January 2007 with respect to claims 4, 6, 10 and 12 under U.S.C. 103(a) have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The following references are cited to further show the state of the art with respect to optimization of a control system.

U.S. Patent No. 7,136,740 discloses a machine tool control apparatus which measures the position/speed of a driven body and the acceleration thereof, which performs control by taking account of the acceleration.

U.S. Patent No. 3,283,229 discloses a redundant fail safety control system.

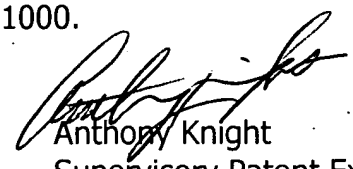
U.S. Patent No. 4,697,768 discloses an error signal which is comprised of a pilot stick command signal and feedback components including measured vertical acceleration and pitch rate of the aircraft and a third feedback component derived from a complementary filter.

U.S. Patent No. 4,879,643 discloses an output vector produced by a plant in response to an input vector is filtered by a number of bandpass filters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer L. Norton whose telephone number is 571-272-3694. The examiner can normally be reached on 8:00 a.m. - 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Anthony Knight can be reached on 571-272-3687. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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